

IMPROVED DIGITAL CAMERA DEVICE WITH METHODOLOGY FOR EFFICIENT  
COLOR CONVERSION

ABSTRACT OF THE DISCLOSURE

5           A digital imaging system is described that provides techniques for reducing  
the amount of processing power required by a given digital camera device and for reducing  
the bandwidth required for transmitting image information to a target platform. The system  
defers and/or distributes the processing between the digital imager (i.e., digital camera itself)  
and the target platform that the digital imager will ultimately be connected to. The system  
10       only performs a partial computation at the digital imager device and completes the  
computation somewhere else, such as at a target computing device (e.g., desktop computer)  
where time and size are not an issue (relative to the imager). This image processing  
technique employs an efficient color conversion process, using a GUV color space. After an  
RGB mosaic (image) is captured, the image may be "companded" or quantized by  
15       representing it with less bits (e.g., companding from 10 bits to 8 bits). The image is then  
mapped from RGB color space to GUV color space, using an RGB-to-GUV transformation.  
Once converted into GUV color space, the image may now be compressed, for instance using  
wavelet transform-based compression, and then transmitted, using wireless or wire-line  
transfer, to a target platform (e.g., desktop or server computer). At the target platform, the  
20       GUV information may be restored in a non-compressed format and then further processed  
into a desired representation (e.g., standard format, such as JPEG). In this fashion, the GUV-  
based methodology avoids the inefficiency of remaining in RGB color space and avoids the  
computational complexity of converting to YUV color space, yet retains the benefits  
associated with YUV color space (e.g., de-correlation of image information).

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